

Isolation and Identification of the Bacilli Producing the Hydrogenase from Sludge in the Region West of Mazandaran

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Background & Objectives: The immethodical use of the fossilized fuels has been led to the undesirable bio environmental effects, including warm-becoming of the earth, air pollution and very hygienic problems. Therefore, organizations related to the global energy ever search for finding the appropriate approaches in order to replace finishing reservoirs of the energy and fossilized fuels. Hydrogen is the most important source of energy which possesses the advantage of reversibility and has not the air- pollution and bio- environmental problems. One of the most important and applied enzymes in the production of the bio-hydrogen is Hydrogenase enzyme which is found in many bacteria. In order to determine the presence of the bacteria producing Hydrogenase from sludge which have a main role in the production of the bio-hydrogen, this study was conducted in the region west of Mazandaran.

Methods: For this purpose, 50 samples from the various surfaces and depths of the sludge were collected and the samples were transferred to the LB Agar culture medium after the preparation of the dilution serial and the (streaking) culture was prepared from that. After the isolation of the single colonies, they were transferred to the allocated culture media such as SPA, MSA and after that they were placed for 48 hours under 250c in the incubator, rate of the activity of the Hydrogenase enzyme was assessed and evaluated with methylene Blue reagent by the spectrophotometer apparatus within the photo wave length of 604 (nm).

Results: from 46 cultures colonies, 9 colonies possess the Hydrogenase activity which, in the meantime, 3 colonies showed more enzymatic strength compared to other colonies possessing the Hydrogenase activity.

Conclusion: The obtained results suggest that the sludge, due to possessing of the plentiful organic and mineral compounds, can be an appropriate habitat for the activity and isolation of this group of the bacteria in order to produce the biohydrogen. Considering that sludge is a cheap and available substrate, the possibility of the growth of the bacteria of this sort can be provided by designing the aerobic and anaerobic culture systems in extensive industrial scale and it's produced hydrogen may be used in the fuel cells.

Keywords: Hydrogenase; Sludge; Bio – Hydrogen